Louisiana Broadband Assessment

Report 2004

Louisiana's Readiness for the Digital Economy

An Initiative Sponsored By:
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The Louisiana Broadband Assessment

The Louisiana Broadband Assessment is an important stepping stone in a process to ensure that Louisiana's businesses, households and citizens have access to the critical information infrastructure that will continue to facilitate growth in a knowledge-based economy. The Louisiana Economic Development Council (LaEDC) identified a need to assess, build, and capitalize on Louisiana's information and telecommunications infrastructure, as a result of the *Vision 2020* effort. This assessment begins that process.

This report highlights Louisiana's supply of Digital Subscriber Line (DSL) and cable modem broadband services and identifies challenges and opportunities for Louisiana's digital future. The information contained in this report represents a current "snapshot" and should be used as the basis for creating a strategy to become a leader in the digital economy. Continued data collection regarding Louisiana's demand and use of broadband services will be critical to attaining a complete "snapshot" of Louisiana's digital future and provide the basis for future action.

What is Broadband and Why is it Important?

Broadband services refer to high-speed Internet connections. For the purposes of this report, The Federal Communications Commission (FCC) definitions of "advanced telecommunications capability" and "high-speed" were used to define broadband services. The FCC defines "advanced telecommunications capability" as data transmission services with upstream and downstream speeds exceeding 200 kbps. "High-speed" denotes services with over 200 kbps capabilities in at least one direction. Broadband is important because many new web-enabled tools require high-speed connections for the application to work. Strong levels of broadband access will allow more businesses and individuals in Louisiana to participate in online technologies such as business-to-business (B2B) transactions and distance learning that are necessary in today's society. The use and sophistication of Internet technologies increases exponentially with access to broadband. You can learn more about the differences between broadband and dial-up services in the glossary of this report.

SZD Public Policy Consultants, Inc., (www.szd.com/services/policy.html)

Data collected for this report was provided by David Matusoff, Director of Technology Planning, SZD Public Policy Consultants, Inc. Mr. Matusoff formerly collected similar data and managed telecommunications public policy initiatives in several states, regions and counties for the Technology Policy Group (www.technologypolicygroup.org) at The Ohio State University. The information presented in this report and future data collection will enable Louisiana to ensure

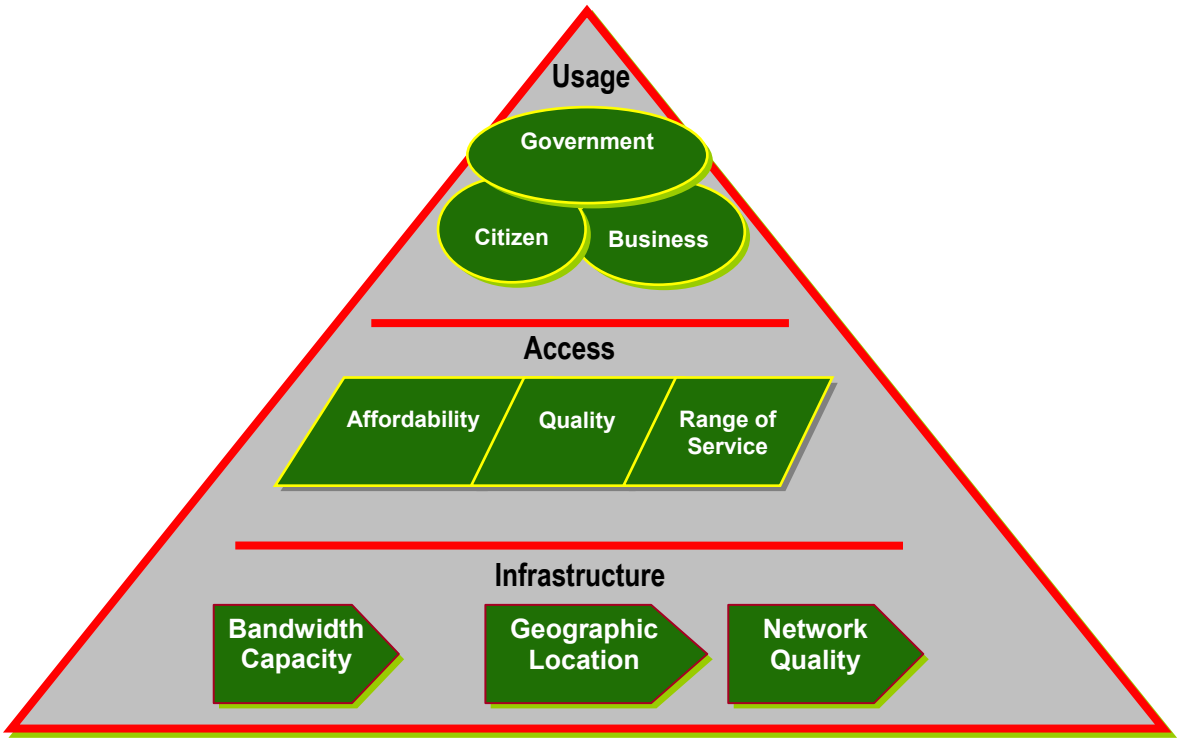
that progress is being made to achieve success in a world where businesses, governments, educational institutions and citizens rely on transferring data to live, learn and work.

The Baton Rouge Technology Council (BRTC) acted as the Louisiana based project manager for this effort. Learn more about BRTC at www.brtc.org.

Louisiana's Information Infrastructure

This report focuses on Louisiana's information infrastructure and access. The data contained within this report serves as a significant starting point to continue learning more about Louisiana's information infrastructure. This report is not intended to be a complete picture of the broadband and advanced telecommunication services landscape in Louisiana.

The graphic below represents the three major components of networking technologies and use. The Information Infrastructure represents the base of the pyramid and supports the Access, which in turn supports the Usage. To achieve success, Louisiana must have enough high quality infrastructure to support the types of affordable services that are being driven by citizen, business and government use of advanced telecommunication services.

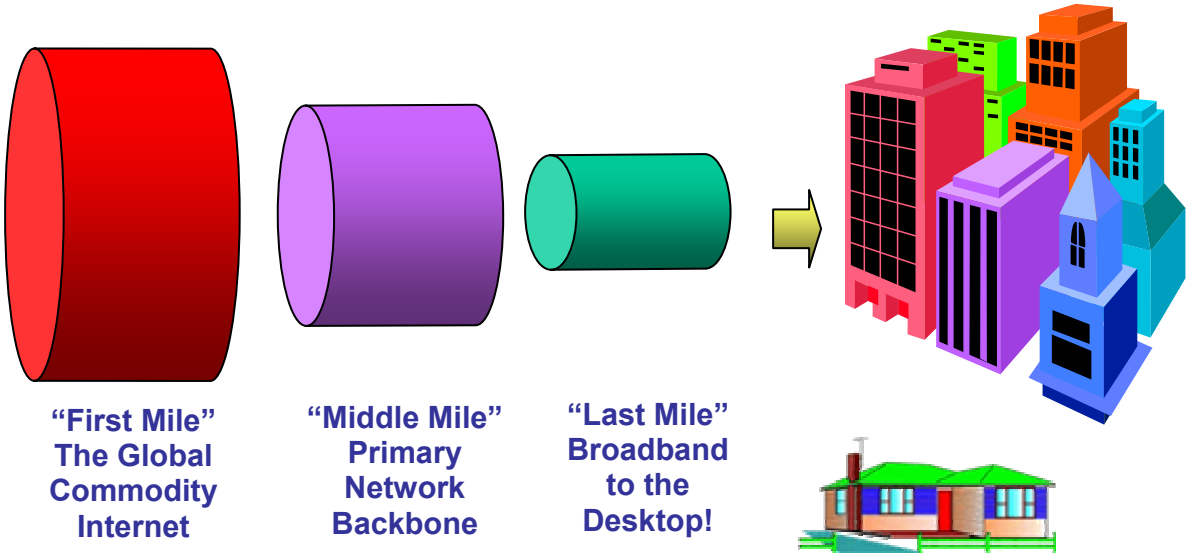


Louisiana's Components of Broadband Availability and Usage

Within the base of the pyramid, a region or state has three components to its information infrastructure; the First, Middle and Last Miles. The Last Mile is often referred to as Broadband connectivity. The First Mile component is commonly referred to as the Global Commodity Internet and it supports communication activities globally.

The graphic below represents the three components of the internet within Louisiana. Recommendations in this report focus on the middle mile and broadband layers of Louisiana's information infrastructure due to the state's ability to impact these two network layers.

Components of Louisiana's Information Infrastructure



Last Mile/ Broadband Availability in Louisiana

Louisiana boasts high levels of DSL and cable modem broadband access compared to states with similar urban/rural demographics. For this assessment, cable modem and DSL technologies were inventoried and mapped throughout Louisiana to gain insights into broadband availability for Louisiana's household and business consumers. Louisiana's broadband providers were surveyed to ascertain their current and future plans for investment in broadband services.

DSL Availability

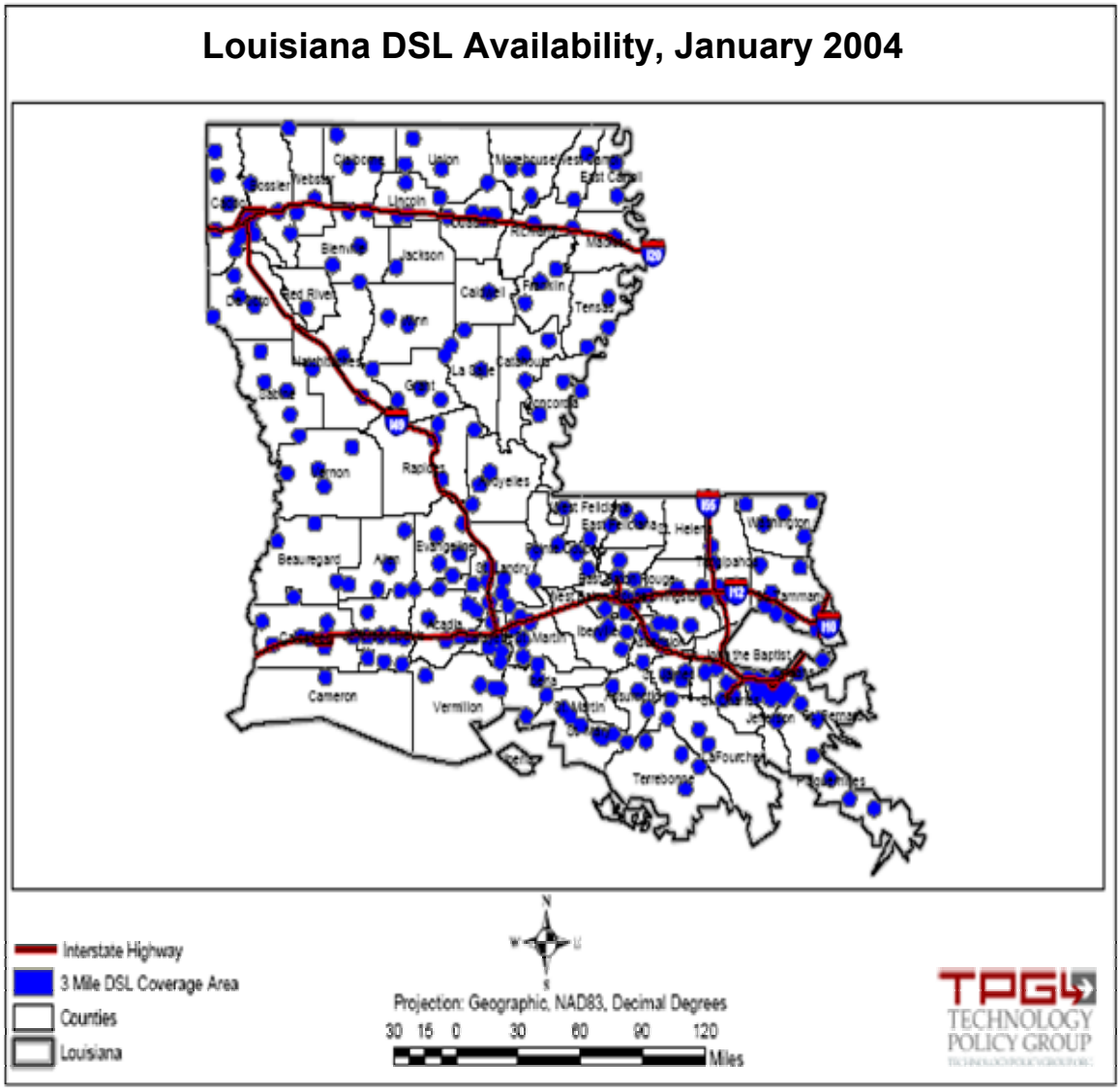
DSL broadband is a technology provided by telephone companies that boosts the level of data transmission over the copper telephone line infrastructure. DSL is viewed as critical, particularly for small businesses without the resources or need for a higher bandwidth, point to point connections.

Louisiana has significant DSL coverage, especially given the large rural population that exists. Bell South and CenturyTel are the largest providers of telephone service within Louisiana and both offer advanced services, including DSL and point–to-point higher bandwidth connections at greater levels than incumbent providers in many comparable regions of the US. Bell South reports enabling all telephone central offices within their service territory to provide DSL by the end of 2004. The smaller local incumbent providers within Louisiana represent a mixed bag in terms of advanced services offered. Some are very aggressive about offering advanced services, while others only provide basic phone services. Throughout Louisiana, businesses can purchase T1 and larger point-to-point direct internet connections, but pricing in many rural areas makes the service cost prohibitive.

DSL data was collected directly from telephone providers in Louisiana. The companies surveyed for this report include:

Bell South	Kaplan Telephone Company
Cameron Telephone	Lafourche Telephone Co.
Campti-Pleasant Hill Telephone Co.	Northeast Louisiana Telephone Co.
CenturyTel	Reserve Telephone Co.
Delcambre Telephone Co.	Star Telephone Co.
East Ascension Telephone Co.	

The map below graphically represents DSL availability within Louisiana. The blue dots represent a theoretical 3 mile radius (industry standard) around telephone central offices that are DSL capable.



Cable Modem Availability

Cable modem broadband is a technology that is delivered by cable companies upgrading their cable systems to provide two way data transmission. The cable infrastructure was initially developed to provide data one way, i.e. a television signal form the cable plant to home viewer. Cable companies nationally have been very aggressive in upgrading their infrastructure to provide high-speed data services. Cable modems are particularly well suited for household consumers because the infrastructure was deployed initially as a residential service and

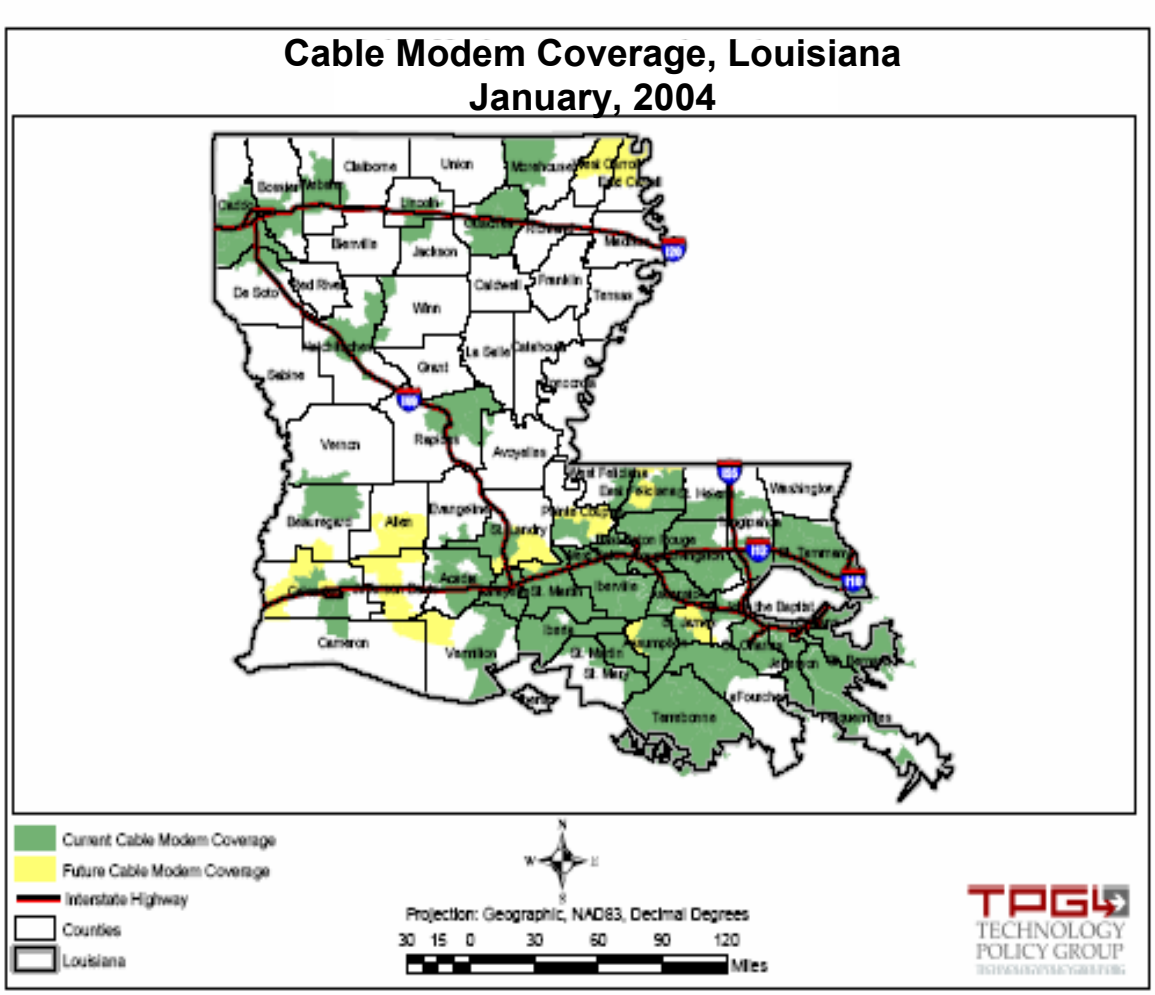
already passed many households. Many Louisiana cable firms however, have been aggressively rolling out business class services. Last mile upgrades for business class services can be expensive due to the construction costs associated with running new cable.

Louisiana has significant cable modem availability for household consumers. Louisiana's cable companies have invested significantly in upgrades to their cable plant to provide these services. In both urban and rural areas with a cable franchise, Louisiana compares favorably to similar states. However, many areas of rural Louisiana are not franchised for cable television, so consumers in those markets will never have access to cable modem technologies. With the advent of reasonably priced satellite television service, it is unlikely that cable television providers will enter those extremely rural markets. Cable providers can not recover the significant costs to extend their networks in unfranchised areas.

Cable modem information was collected through the Louisiana Cable and Telecommunications Association, which surveyed all cable television companies in Louisiana. The companies surveyed include:

Allen's TV Cable Service	Medicom
Cebridge Communications	Reserve Telecommunications
Charter Communications Affiliates	Spillway Communications
Cox Communications Affiliates	Time Warner Affiliates
CMA Cablevision Affiliates	Trust Cable TV

The map below graphically represents current and future cable modem coverage in Louisiana. The green areas represent current cable modem coverage and the yellow represent future cable modem availability as reported by the cable providers in Louisiana.



Wireless Broadband Availability

Wireless broadband availability was not measured as part of this assessment, but many wireless broadband efforts were referenced through the outreach component of this project. Wireless technologies are improving rapidly and their applications for providing broadband services have the potential to extend broadband to rural parts of the Louisiana where cable modem and DSL technologies do not reach. In fact, wireless broadband is already beginning to fill in the broadband availability gaps within Louisiana. Satellite based broadband services are also available, but pricing makes this technology cost prohibitive for many consumers. Wireless broadband services will need to be measured in the next phase of this process to ensure Louisiana has a complete “snapshot” of broadband availability.

Wireless Broadband Best Practice

Vivian Louisiana is a town with a population of approximately 4000 that lacked broadband services. Local residents were unsuccessful in attempts to obtain broadband service from local cable or telephone providers. A non-technical local resident researched wireless broadband access and developed a low cost wireless solution to provide broadband services within the community.

Fastline Internet (www.fastlineinternet.com) was created as a result of the effort and now they provide wireless mesh networking technologies in other rural areas.

Broadband Conclusions

Louisiana compares favorably to more "urban states" with respect to cable modem and DSL broadband access, but rural/urban disparities still exist. Wireless broadband services have the potential to fill in the coverage gaps in some areas, but only robust competition will drive down prices for these services. Cost of service is the major impediment to greater degrees of broadband adoption nationally.

Consumer take-rates (the rate by which individuals with access to broadband purchase those services) for broadband services in Louisiana appear to be much lower than national averages. Empirical survey data will be necessary to better understand this issue among Louisiana's household and business consumers. Household and business usage surveys will be a component of the next phase of this process to gain more granular detail about the lack of consumer demand for broadband services in Louisiana.

Broadband Recommendations

1. **Boost the usage of broadband services throughout Louisiana's households, businesses, schools and governments.** Louisiana currently suffers from a "Technology Sophistications Gap." Broadband is available at higher levels than anticipated, but take rates lag significantly compared to national averages. Public and private leadership must make this issue a priority if Louisiana expects to have a workforce and businesses that can compete in the 21st Century economy.

2. **Boost competition for broadband service offerings to Louisiana's small to medium sized businesses.** Since small businesses make up the largest percentage of businesses, particularly in rural areas, affordable

broadband access is a critical competitive advantage. In many instances, increased communication between communities and providers is necessary to facilitate new broadband investments. Creative solutions must be driven at the local level. Local Governments or Chambers of Commerce can intervene with providers on behalf of small businesses to boost competition in communities where businesses lack broadband access or have access to only one technology. These organizations can help to aggregate the small business demand and create a new case for investment to providers.

Since the cable infrastructure was developed to serve residential consumers, cable infrastructure does not pass many small businesses. Extending cable to those businesses is an expensive proposition for the provider and those costs are passed along to the businesses. Chambers or local governments can identify geographic groupings of small businesses that need broadband service and work with the local cable provider to develop no or low cost last mile solutions. This proposition makes broadband more affordable to small businesses and creates an instant market for business class broadband services.

3. **Develop a public/private partnership to educate Louisiana on the benefits of broadband adoption**. Create strategies that are specific to all sectors within Louisiana to increase adoption rates for broadband use. Lead by example, proselytize and market this effort both internally and externally. Marketing has contributed significantly to states and regions that have been successful in creating new economic development initiatives.

4. **Develop new legislation to address the lack of broadband availability in small rural communities.** Private sector providers will not likely invest in these communities in the foreseeable future due to low returns on their investments. Many of these communities have languished in terms of traditional economic opportunities and lack of broadband access will further disadvantage these communities.

   Many states have implemented legislation to address digital-divide issues, but Louisiana's challenges are unique. Since the provider community has already invested significantly in broadband availability, the legislation needs to address only the smallest communities. Any legislation that is introduced should not include increased regulatory burdens on providers; it should incentivize investment in very rural portions of Louisiana.

   Suggested legislation might include "technology-neutral" tax incentives for providers willing to make investments in communities with a population of less than 5000. In return for tax incentives on a percentage of investment costs to the providers, Louisiana should require providers to create partnerships at the local level to develop community based education efforts that will boost the demand for these services. This will help create educated consumers who will be more likely to purchase the service.

Middle Mile /Network Backbone

The middle mile is the network component that provides the primary network connecting Louisiana to the national and global first mile of the internet. This level of internet connectivity is critical to states because these national providers supply the high bandwidth services to large businesses, governments, internet service providers and other demanding network users that are critical to economic expansion within the state.

Since Louisiana is situated between major metropolitan areas in Texas, Florida and Georgia, Louisiana has significant amounts of middle mile connectivity traveling through the state. However, many of the major network providers with lines running through Louisiana do not have off ramps or PoPs (Internet Points of Presence). Many middle mile providers overlooked Louisiana due to lack of demand.

Due to the current telecommunications downturn, it's unlikely that these providers will elect to make new investments in Louisiana unless businesses or community's supply a reasonable return on investment for these assets.

National network backbone assets were researched and providers were surveyed for this project to determine the level of middle mile capacity within Louisiana, which includes PoPs and speed within these middle mile lines. The data was then aggregated to compare the middle mile connectivity to other states or regions. This data was collected from many sources to identify the providers offering services in Louisiana. The providers surveyed include:

Aleron	MCI
AT&T	McLeod USA
Broadwing	Nortel/ CapRock
Cable & Wireless	One Call
Cogent Communications	Optigate
Cypress	Quest
Electric Lightwave	Sprint
Global Crossing	Telia Internet
Infonet	WilTel Comm
Level 3	Winstar
SBC	Xspedius Comm
PSI Net	

Of the more than 20 national providers surveyed, only 9 had connections or PoPs within Louisiana. Using similar data that was collected in other states within the last 2 years, both New Orleans and Baton Rouge have significantly less middle mile connectivity than their counterparts in other states. Although Louisiana's incumbent telephone providers have invested significantly in the middle mile, increased competition will provide better pricing and services.

City/Region	No. of Connections	Total Mbps
Detroit	128	404,775
Columbus, OH	71	140,165
Indianapolis	74	201,286
Hartford, CT	19	101,366
New Orleans	13	48,040
Baton Rouge	11	67,590
Cleveland	176	336,214

Due to the lack of middle mile investment by national firms, Louisiana must rely on in state and regional providers for these services. Louisiana must boost the demand for these services to realize cost savings associated with robust competition in this market.

Middle Mile Industry Specific Solutions in Louisiana

Gulf Fiber Corporation (www.gulffibercorp.com) is a Texas based company that provides connectivity to the offshore industry. To achieve affordable solutions for offshore operations that require high-bandwidth communications capacity, Gulf Fiber Corporation invested in PoPs in Fourchon, New Orleans and Lafayette. This is a good example of a regional based company meeting the demand of an industry segment that is critical to Louisiana's economy. Industry specific investments like these can be leveraged to create more robust competition in other vertical markets.

Many states are leveraging publicly owned and operated telecommunication and broadband assets to create overall cost savings and improve service delivery to public constituencies and institutions including; K-12, higher-education, state agencies and local governments. This section provides a brief overview of potential opportunities within Louisiana to leverage these investments.

Higher Education Research Networks

Louisiana's major research institutions are in the process of "building" the case for the Louisiana Optical Network Initiative (LONI), a high-capacity research network that will serve higher education institutions and foster collaborative research and development throughout Louisiana. These types of networks are critical to state competitiveness and will facilitate the research that will provide for growth in Louisiana's economic future.

LONI proposes to create a statewide network environment that can integrate and aggregate Louisiana's competencies which are geographically distributed across universities and industries. The proposed LONI initiative has two components; the Louisiana Advanced Regional Network (LARN) that connects the major research institutions within Louisiana and the LAGrid, which will enable collaboration among Louisiana's researchers and industry. LARN will connect the major research centers at LA Tech, ULL, SU-Baton Rouge, LSU-Baton Rouge, UNO, LSUHSC-Shreveport, LSUHSC-NO and Tulane University. LONI, the complete system incorporating both the network (LARN) and grid (LAGrid) is a direct investment in the *Vision 2020's* major goals to foster learning enterprises and cultural innovation. This initiative will lead to increased rankings in many indicators that are key to selling Louisiana as an innovative state.

This initiative will make Louisiana competitive with other states and research institutions that have already developed these types of research and collaboration tools. LONI will also provide a competitive advantage to Louisiana, compared to other states with significant research network initiatives due to the tight links this will establish between industry and research. This effort is more closely tied through application development to Louisiana's long-tem economic strategy than some initiatives in other states. Applications development should be focused on the state's industry clusters and serve high technology companies already in place, as well as leverage relationships at the national and international levels. Opportunities to enhance Louisiana's competitiveness exist in all of the *Vision 2020* targeted clusters:

- Oil & Gas and Energy
- Information Technology
- Transportation/Logistics
- Durable Goods
- Entertainment
- Advanced Materials
- Biotech
- Agriculture/Food Technology
- Petroleum and Environmental

Research network collaborations like LONI have created significant returns on investment that are both direct and indirect for the states that have already implemented these types of initiatives. The presence of a rich research collaboration tool like LONI provides a solid foundation for developing and sustaining key components to Louisiana's future success.

Currently, Louisiana's research community is pursuing state funding to support this innovative research network initiative. Several options have been explored to facilitate the technical and administrative functions of LONI, including utilizing the Department of Transportation and Development's fiber assets to deploy the service. Regardless of the exact technical and administrative functions that are agreed upon, Louisiana must invest in this initiative to keep pace with competitive states and facilitate the growth of the targeted clusters identified in the Louisiana *Vision 2020* IT Initiative.

The Proposed LARN Network

This map was provided by LSU and shows the geographic distribution of the LARN network, linking Ruston, Shreveport, Lafayette, Baton Rouge, and New Orleans with dedicated research capacity and bandwidth to link the five *Vision 2020* campuses, two medical centers, and Tulane University. The actual "star" network topology will emanate from Baton Rouge.

Department of Transportation and Development's (DOTD) Fiber Network

In 2001, DOTD acquired the use of fiber optic infrastructure that follows Louisiana's major highways from New Orleans to Monroe, in exchange for an estimated $4.3 million in waived right-of-way fees. This potential asset has been

independently assessed previously and remains a contentious issue between public and private telecommunications interests within Louisiana.

There is no question that this asset can provide significant connectivity within Louisiana, but the critical question remains how Louisiana should approach this asset. Currently, the DOTD fiber network is being considered as a potential delivery mechanism for the higher-education LONI network initiative.

The debate surrounding this issue provides an opportunity for Louisiana to change the paradigm by which network connectivity is approached. The focus must shift from circuit and asset based, to service delivery based. Given the current telecommunications market and the aggregate demand that the state brings to the table, Louisiana is well positioned for this change in purchasing practices to occur. Louisiana must inventory all state and local government telecommunication and broadband assets to quantify your purchasing power before entering into new agreements. Some common themes that must be considered in approaching future state networking activities include:

- Economies of Scale
- Services Rather than Circuits
- Scalability
- Quality of Service
- Redundancy

Higher education in Louisiana has already begun this approach through LONI and the rest of state government needs to follow. Regardless of how the DOTD asset is utilized for state government purposes, these common themes need to be addressed and some critical questions need to be answered.

- How will the state leverage the DOTD asset to extend services and capabilities to Louisiana's networking constituencies?
- Is Louisiana willing to let the private sector light and manage this asset if it provides increased capacity and cost savings for public institutions, including local governments?

Louisiana needs to consider all options to leverage this asset as part of an overall service delivery mechanism that improves Louisiana's ability to manage bandwidth and plan for future growth in networking capabilities.

Municipal Fiber Rings

Municipal fiber rings are being deployed in communities of all sizes throughout the country. In some instances, they are built because private sector providers are not willing to meet the demand for high bandwidth services in a particular community. In many instances, they are built by a municipally owned utility provider to meet the growing demand for additional network capacity locally and are operated as an additional utility. Although many models exist for building and financing these

networks, they provide new opportunities for access to and competition for high bandwidth services within a community. Many communities that have engaged in building these networks report new entrants into the market following implementation and better pricing as a result.

Lafayette is home to a 65 mile series of multiple fiber rings that provide internet backbone services throughout the city (http://www.lafayette.org/site50.php). Lafayette Utilities System, the local publicly owned utility installed the asset to provide robust services to large bandwidth consumers locally. Excess capacity is sold on a wholesale basis to telecommunications providers. This municipal based fiber ring provides advantages to the community through creating significant access for the business community and increasing competition within the market that has driven down the overall costs of network services.

Municipal fiber rings are not the answer for many communities struggling to overcome lack of network capacity, due to the significant costs associated with constructing and managing such networks. In some instances however, municipal fiber rings have brought a significant return on investment for the community.

Middle Mile Recommendations

1. **Promote middle mile competition in Louisiana by adopting smart principles for public Right-of-Way (ROW) agreements.** Competition in the market is the leading factor to achieving better prices and services. The National Association of Regulatory Utility Commissioners (NARUC) developed best practices for facilitating cooperation between providers and state and local government entities. These principles should be considered to promote Louisiana as a state that is "provider friendly."

    - Access to ROW should be extended to all telecommunications providers, as long as they receive authorization from the appropriate unit of government, given that such authorization shall not be unreasonably denied.

    - Government entities should act on a request for authorization to operate and place equipment in the Public Right-of-Way (PROW) within a reasonable and fixed period of time from the date that the request for such access is submitted.

    - Authorized providers shall apply for construction permits to place equipment in the PROW with the proper unit of government. Such permits shall be processed within a reasonable and fixed period of time from the date that the request for construction is submitted.

    - Fees charged for PROW access shall be published in writing.

- All providers should be subject to equivalent terms and conditions of access to the PROW, subject to reasonable alternatives in particular cases, such as overcrowding and/or alternate route planning.

- For management purposes, the appropriate state or local authority should be able to identify the owner and the location of all facilities in the PROW.

- PROW construction permits shall not contain terms, qualifications, procedures, or other requirements unrelated to the actual management of the PROW. This does not preclude requirements for proof of authorization, indemnification of liability, insurance bonding, or construction route planning.

- Appropriate unit of government authority may take into account relevant public safety concerns, zoning and planning regulations as long as they do not unreasonably discriminate among service providers.

- Standard engineering practices should be used to manage construction in the PROW and to guide the development of any engineering standards involving placement of facilities and equipment in the PROW. Standard engineering practices should include coordination with adjacent landowners where future road improvements will impact construction in the PROW.

2. Develop and release a Request for Proposal (RFP) to create the specifications of a world class advanced networking capability for all public institutions within Louisiana that is scalable and can provide for future growth. The RFP should include all voice, video and data needs of public agencies within the state. Although Louisiana does not need to compete with private sector network providers to achieve this level of service, Louisiana can change the paradigm for purchasing these types of services from circuit based to service based.

   Louisiana can aggregate the public sector demand for these services and benefit from more competitive services and pricing. This also provides an opportunity for the private sector to leverage the DOTD asset for service delivery. Once the specifications are in place, release an RFP to implement the network. Louisiana should leverage its position as a large consumer of these services to promote affordable access and pass this capability on to provide relief to local governments struggling with connectivity issues.

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Planning for Louisiana's Digital Future

Focus Groups were facilitated throughout Louisiana in an effort to gain anecdotal information about broadband deployment and use. The "town hall" style meetings took place in different types of communities to comprehend the unique needs that must be addressed to overcome broadband supply and demand issues within Louisiana.

Broadband infrastructure data was combined with national survey results on broadband use to develop scenarios for network advancement and boosting usage of advanced telecommunication services in Louisiana. Participants were presented with a number of broadband indicators that Louisiana might focus on to improve overall state competitiveness. Certain indicators emerged throughout the meetings and discussions that were determined to be critical to Louisiana's future.

The critical indicators include:

- Business & Household broadband access
- Networked state government
- Networked k-12 institutions
- Networked higher-education institutions

Household and Business Broadband Access

The overall sentiment regarding broadband availability was that is was available at sufficient levels in urban and suburban communities, but that many rural communities lacked sufficient and affordable access. The state should play a role in extending broadband services to very rural communities.

Cost was identified as the leading impediment among all sectors to increased broadband adoption, particularly in small businesses and households. This issue was magnified within rural communities due to lower income levels and lack of competition in the broadband market. Although the perceived value of broadband is increasing, many small businesses and consumers are still waiting for the "killer application" to switch from dial-up modem to broadband service.

Louisiana must overcome negative stereotypes regarding technology sophistication both externally and internally. Rural communities can suffer from a "collective low self esteem," regarding broadband adoption and technology sophistication. Since success in technology-led economic development is always

driven at the local level, communities must overcome these negative stereotypes to succeed in the future.

In the next phase of this project, Louisiana will complete additional analysis to determine consumer broadband access in the state. Once this is established at the regional level, communities need to determine for themselves what percentage of their citizens should have access to broadband services and design local strategies to achieve their goals.

Networked State Government

Like many states, Louisiana has made significant efforts to provide an on-line presence that facilitates access to information and services provided by the state. Focus group participants did not have strong feelings about the states delivery of services, but a need for leadership was identified within state government.

Louisiana has the opportunity to make broadband access and use a key priority in the economic development strategy for the state. To accomplish this, Louisiana needs to elevate the Chief Information Officer (CIO) to a cabinet level position. This would send a clear message to state government constituencies that information technology is critical to all state business and functions.

In addition to the CIO, state government can play a leadership role by driving demand for broadband services, particularly in rural areas. If Louisiana successfully developed a new networking strategy that focuses on service delivery rather than circuits, local governments could access those services to develop and implement on-line strategies locally. This can create a trickle down effect and spur broadband adoption among rural businesses and citizens. Many successful rural technology projects are driven locally by the public rather than private sector.

Networked k-12 Institutions

This area of discussion produced some rich content from the focus groups. Many participants made it apparent that there exists technology haves and have nots in the k-12 educational arenas throughout Louisiana. Anecdotally, many of the “have nots” appear to be in rural communities. This is an unacceptable situation and further disadvantages students who do not have access to other educational resources available in more urban and suburban communities.

Specifically, discussion focused on broadband availability and use. The answer to those questions highlighted the varying degrees of broadband access and use among k-12 schools within the state. Some reported no broadband access at all. Others reported access, but only for administrative purpose. Others reported broadband access for administrative and educational purposes, but no technology integration within the class rooms. Although some schools have sufficient

broadband access and have successfully integrated broadband and information technologies into the curriculum, serious inequities exist among schools.

This inequity is a critical issue that needs to be addressed within the Department of Education leadership. Regardless of tightening state budgets, policies need to be developed to begin to overcome these inequities in the educational delivery system of Louisiana. One educator in attendance suggested that the Department of Education needs to update its data collection techniques to properly understand and ensure technology is being addressed and implemented in "technology plans" within districts.

Both educators and service providers agreed that E-Rate funding is not being leveraged effectively in the state. The E-Rate funding process is difficult and cumbersome and many districts do not have the time or resources to effectively secure E-Rate funding for technology.

Louisiana has an opportunity to correct these issues, but they must be addressed at the Administration level. Louisiana needs to commit to a technology vision for K-12 schools and identify the barriers to overcome and actions to take to achieve that vision.

Networked Higher-Education Institutions

The general sentiment regarding higher-ed access and use within the focus groups was that the higher-ed community was effectively accessing and utilizing technology and broadband services.

The areas of concern, particularly in rural Louisiana centered on distance education. The problem however, is centered more on residential broadband access than content delivery. Delivery of rich distance education content is difficult to provide if broadband is not available to the students who can benefit the most from the service.

The community college system provides the bulk of work force training for entrants into new fields and for displaced workers. Distance education is a critical work force development tool in communities that have lost significant amounts of jobs due to plant closings and lay-offs. In rural communities in particular, where the work force does not have the options available to more urban and suburban communities, distance education provides a critical need. Educational institutions struggle with developing content that their students can't access due to slow dial-up connections, so they are forced to develop content based on the lowest level of anticipated internet service in student's homes. This issue can only be addressed though increased residential broadband access.

Other higher-ed issues that were briefly covered in the town hall meetings include accessing the research network for economic development purposes and collaborative research.

Louisiana appears to be well positioned in this area, assuming the LONI project is funded. Strong leadership within the Board of Regents has resulted in an economic asset for Louisiana.

Project Recommendations & Action Agendas

Develop a high level public/private partnership to

- set goals for the state for a comprehensive plan of action to improve the supply of demand of broadband services;
- educate Louisiana on the benefits of broadband adoption;
- prioritize elements of future data collection and analysis to insure Louisiana's competitiveness in the digital economy.

Last Mile/ Broadband Issues

1. Boost the usage of broadband services throughout Louisiana's households, businesses, schools and governments through education, marketing, and community support.
2. Boost competition for broadband service offerings to Louisiana's small to medium sized businesses. Competition is necessary to drive down prices, which will increase adoption rates.
3. Develop new legislation that addresses the lack of broadband availability in small rural communities by creating technology neutral incentives for providers.

Middle Mile

1. Promote middle mile competition in Louisiana by adopting smart principles for public Right-of-Way agreements.
2. Develop and release a Request for Proposal (RFP) to create the specifications of a world class advanced networking capability for all public institutions within Louisiana that is scalable and can provide for future growth.

Overcoming the Challenges Facing Louisiana's Digital Future in Four Critical User Groups

Household and Business Broadband Access

- Projects must be driven locally through creative partnerships with local industry, State extension agents, educational institutions, and others.
- Communities must create locations where citizens can "test drive" technology and begin to understand its benefits to them personally and professionally. The State can assist by providing leadership through education and outreach efforts to local governments.
- Louisiana must conduct an ongoing demand assessment by surveying Louisiana's households and businesses to better understand how these user groups are adopting advanced technologies and broadband to design strategies to boost usage.
- The State must update the broadband maps annually and survey wireless broadband providers to create a complete "snapshot" of Louisiana's supply of advanced telecommunication services.
- K-20 educational institutions must work with the provider community to insure broadband access for the robust delivery of distance learning applications.

Networked State Government

- Elevate Chief Information Officer to a Cabinet level position. This will elevate the importance of technology and broadband within state government and ensure that all agencies are integrating these capabilities into service delivery, as well as provide a means for aggregating demand and purchasing services.
- Develop and release a Request for Proposal (RFP) to create the specifications of a world class advanced networking capability for all public institutions within Louisiana that is scalable and can provide for future growth. This will create significant cost savings, eliminate duplication of services, and provide better services to state and local governments in Louisiana.

Networked K-12

- Conduct an assessment of broadband use and technology integration in schools.
- Develop minimum standards to overcome the inequities that exist in broadband availability in Louisiana schools.
- Develop a statewide E-Rate initiative to educate school districts on accessing and leveraging these federal funds to integrate technology.

Networked Higher Education

Fund LONI, Louisiana's Optical Network Initiative. This will

- Create a world class research and development tool
- Make Louisiana's colleges and universities competitive
- Provide opportunities for higher ed and private industry to collaborate and support *Vision 2020's* cluster strategy.

Final Conclusion

Louisiana is well positioned to take advantage of the advanced telecommunications and broadband opportunities and challenges that are highlighted within this report. Immediate action is required If Louisiana expects to capitalize on this opportunity. Significant public and private leadership and vision are necessary to implement the stated action agendas and achieve success in the digital economy.

Glossary of Terms

Access: The technology choices available by which users can connect to the public data network at the level they demand or need (dialup, cable, DSL, ISDN, wireless, etc.)
B2B (Business-to-Business): The exchange of products, services, or information between two or more businesses using networked technologies.
B2C (Business-to-Consumer): The exchange of products, services, or information between businesses and consumers over the Internet.
Bandwidth: The amount of data that can be transmitted in a given amount of time over a particular connection.
Broadband: Data transfer over 200 Kbps. DSL and cable modem services are broadband services.
Cable modem: A device that enables a personal computer to be connected to a local cable TV line and receive and send data.
Dial- up access: Refers to connecting to the Internet via a modem and standard telephone line.
DSL (Digital Subscriber Line): A technology which enables the ordinary copper component of telephone lines to carry data at rates much higher than ISDN.
E-commerce (Electronic commerce): Commercial and non-commercial transactions facilitated through the use of networked technologies.
EDI (Electronic Data Interchange): The transfer of data between companies using computer networks, such as the Internet.
Gbps (Gigabits per second): A measurement of the rate of speed at which data is transferred (e.g., 1 Gbps equals 1 billion bits per second).
Infrastructure: The communication networks that connect users to the Internet.
IT (Information Technology): The broad subject concerned with all forms of technology used to manage and process information electronically.
ISDN (Integrated Services Digital Network): A service that allows for higher data transmission speeds and is capable of handling at least two services over one line simultaneously (i.e., voice and fax or voice and data).
ISP (Internet Service Provider): A company or organization that provides users with connectivity to the Internet.
Kbps (kilobits per second): The rate of speed at which data is transferred (e.g., 1 Kbps equals 1,000 bits per second).
Last mile: The connection from the ISP to the user's desk- top.
Mbps (Megabits per second): A measurement of the rate of speed at which data is transferred (e.g., 1 Mbps equals 1 million bits per second).
OC192 (Optical Carrier level-192): An optical fiber line that supports digital signal transmissions at 48 times the base rate of 51.54Mbps or approximately 9.7 Gbps.
T1: Dedicated phone connection providing maximum speeds up to 1.544 Mbps.
Telecommunications: Refers to all types of data transmission, from voice to video.
Usage: The extent to which business, government and household users utilize the Internet access and infrastructure available to them.
Wireless access: A communications system in which radio- frequency or infrared waves carry a signal through the air, rather than along a wire.
World Wide Web (www): The system of Internet servers and users that support documents formatted in the HTML language.